REMARKS

Prior to the present amendments, claims 1, 4-5, 9, 15, 17-19, 22, 39-57 and 59 were pending in the application. The claims were rejected, variously, under Sections 101, 102, 103 and 112 of 35 U.S.C. In view of the cancellation of , claims 1, 4-5, 9, 15, 17-19, 22, 39-57 and 59, the various rejections are believed to be moot.

A new set of claims, claims 63-74 are being submitted. In response to the Notice of Con-Compliant Amendment, mailed June 22, 2010, "(New)" has been inserted in these claims. Claims 63-74correspond (with some differences in dependencies in view of U.S. practice) to the claims in applicant's granted European Patent EP 1 914 722 B1, a counterpart to the present application. Support for the new claims is indicated in footnotes to the following presentation of the claims:

Support for New Claims 73-74

63. A method for decoding M encoded audio channels representing N audio channels,[1] where N is two or more,[2] and a set of one or more spatial parameters, the method comprising:[3]

a) receiving said M encoded audio channels and said set of spatial parameters[4],

b) deriving N audio signals from said M encoded channels[5], wherein each audio signal is divided into a plurality of frequency bands, wherein each band comprises one or more spectral components[6], and

c) generating a multichannel output signal from the N audio signals and the spatial parameters[7],

whereby

M is two or more[8],

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[1] Paragraph 0005 of applicant's 2007/0140499 publication; FIGS. 7 & 9

[2] Paragraph 0016; FIGS. 7 & 9

[3] Paragraphs 0029-0034; FIGS. 7 & 9

[4] Paragraphs 0040 and 0357; FIGS. 7 & 9

[5] Paragraphs 0040 and 0348; FIGS. 7 & 9

[6] Paragraph 0018

[7] Paragraph 0348; FIGS. 7 & 9

at least one of said N audio signals is a correlated signal derived from a weighted combination of at least two of said M encoded audio channels[9],

said set of spatial parameters includes a first parameter indicative of the amount of an uncorrelated signal to mix with a correlated signal and[10]

step c) includes deriving at least one uncorrelated signal from said at least one correlated signal, and controlling the proportion of said at least one correlated signal to said at least one uncorrelated signal in at least one channel of said multichannel output signal in response to one or ones of said spatial parameters[11], wherein said controlling is at least partly in accordance with said first parameter[12].

64. The method of claim 63 wherein step c) includes deriving said at least one uncorrelated signal by applying an artificial reverberation filter to said at least one correlated signal[13].

65. The method of claim 63 wherein step c) includes deriving said at least one uncorrelated signal by applying a plurality of artificial reverberation filters to said at least one correlated signal[14].

66. The method of claim 65 wherein each of said plurality of artificial reverberation filters has a unique filter characteristic[15].

67. The method of claim 63 wherein said controlling in step c) includes deriving a separate proportion of said at least one correlated signal to said at least one uncorrelated signal for each of said plurality of frequency bands, at least partly in accordance with said first parameter[16].

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[8] Paragraphs 0005 and 0357

[9] Paragraph 0343

[10] Paragraph 0352

[11] Paragraph 0352; FIG. 9

[12] Paragraph 0352; FIG. 9

[13] Paragraph 0352; FIG. 9

[14] Paragraph 0352; FIG. 9

[15] Paragraph 0352; FIG. 9

[16] Paragraph 0352; FIG. 9

68. The method of claim 63 wherein said N audio signals are derived from said M encoded audio channels by a process that includes dematrixing said M encoded audio channels[17].

69. The method of claim 68 wherein the dematrixing operates at least partly in response to one or ones of said spatial parameters[18].

70. The method of claim 63 further comprising shifting the magnitudes of spectral components in at least one of said N audio signals in response to one or ones of said spatial parameters[19].

71. The method of claim 63 wherein said multichannel output signal is in the time domain[20].

72. The method of claim 63 wherein said multichannel output signal is in the frequency domain[21].

73. The method of claim 63 wherein N is 3 or more[22].

74. An apparatus comprising means adapted to carry out each of the steps of any one of the methods of claims 63 – 74.

Response to "Claim Objections"

The Office Action pointed out that applicant's Preliminary Amendment of August 31, 2006 misnumbered the claims, indicating that "a clean version with the original claim numbers, as in the Index of Claims, is required subsequent to this action." In response to that requirement, here is a clean version of the Preliminary Amendment with the correct claim numbers:

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[17] Paragraph 0348; FIG. 9

[18] Paragraph 0348; FIG. 9

[19] Paragraph 0058; original claim 25

[20] Paragraph 0049

[21] Paragraph 0049

[22] Original claims 10 and 28; Paragraphs 0049 and 0360

CLEAN VERSION OF CLAIMS AS AMENDED BY PRELIMINARY AMENDMENT OF AUGUST 31, 2006

1. (Original) In an audio encoder receiving at least two input audio channels, a method comprising

determining a set of spatial parameters of the at least two input audio channels, the set of parameters including a first parameter responsive to a measure of the extent to which spectral components in a first input channel change over time and to a measure of the similarity of the interchannel phase angles of said spectral components of said input channel relative to those of another input channel.

2. (Canceled)

3. (Canceled)

4. (Currently Amended) An audio encoding method according to claim 1 wherein the set of parameters further includes a further parameter responsive to the phase angle of spectral components in said first input channel relative to the phase angle of spectral components in said another input channel.

5. (Currently Amended) An audio encoding method according to claim 4 further comprising generating a monophonic audio signal derived from said at least two input audio channels.

6. (Canceled)

7. (Canceled)

8. (Canceled)

9. (Currently Amended) An audio encoding method according to claim 4 further comprising generating multiple audio signals derived from said at least two input audio channels.

10. (Canceled)

11. (Canceled)

12. (Canceled)

13. (Canceled)

14. (Canceled)

15. (Currently Amended) An audio encoding method according to claim 1 wherein the set of parameters further includes a parameter responsive to the amplitude or energy of said first input channel.

16. (Canceled)

17. (Currently Amended) In an audio encoder receiving at least two input audio channels, a method comprising

determining a set of spatial parameters of the at least two input audio channels, the set of parameters including a parameter responsive to the occurrence of a transient in a first input channel.

18. (Original) A method of decorrelating an audio signal with respect to one or more other audio signals, wherein the audio signal is divided into a plurality of frequency bands, each band comprising one or more spectral components, comprising

shifting the phase angles of spectral components in the audio signal at least partly in accordance with a first mode of operation and a second mode of operation.

19. (Original) The method of claim 18 wherein shifting the phase angles of spectral components in the audio signal in accordance with a first mode of operation includes shifting the phase angles of spectral components in the audio signal in accordance with a first frequency resolution and a first time resolution, and shifting the phase angles of spectral components in the

audio signal in accordance with a second mode of operation includes shifting the phase angles of spectral components in the audio signal in accordance with a second frequency resolution and a second time resolution.

20. (Canceled)

21. (Canceled)

22. (Currently Amended) The method of claim 18 wherein said first mode of operation comprises shifting the phase angle of spectral components in at least one or more of the plurality of frequency bands, wherein each spectral component is shifted by a different angle, which angle is substantially time invariant, and said second mode of operation comprises shifting the phase angles of all the spectral components in said at least one or more of the plurality of frequency bands by the same angle, wherein a different phase angle shift is applied to each frequency band in which phase angles are shifted and which phase angle shift varies with time.

23. (Canceled)

24. (Canceled)

25. (Canceled)

26. (Canceled)

27. (Canceled)

28. (Canceled)

29. (Canceled)

30. (Canceled)

31. (Canceled)

32. (Canceled)

33. (Canceled)

34. (Canceled)

35. (Canceled)

36. (Canceled)

37. (Canceled)

38. (Canceled)

39. (Original) In an audio decoder receiving M encoded audio channels representing N audio channels, where M is one or more and N is two or more, and receiving a set of spatial parameters relating to the N audio channels, a method comprising

deriving N audio channels from said M audio channels, wherein an audio signal in each audio channel is divided into a plurality of frequency bands, wherein each band comprises one or more spectral components, and

shifting the phase angle of spectral components in the audio signal in at least one of the N audio channels in response to one or ones of said spatial parameters, wherein said shifting is at least partly in accordance with a first mode of operation and a second mode of operation.

40. (Original) The method of claim 39 wherein said N audio channels are derived from said M audio channels by a process that includes passively or actively dematrixing said M audio channels.

41. (Original) The method of claim 39 where M is two or more and said N audio channels are derived from said M audio channels by a process that includes actively dematrixing said M audio channels.

42. (Original) The method of claim 41 wherein the dematrixing operates at least partly in response to characteristics of said M audio channels.

43. (Original) The method of claim 41 or claim 42 wherein the dematrixing operates at least partly in response to one or ones of said spatial parameters.

44. (Original) The method of claim 39 wherein shifting the phase angles of spectral components in the audio signal in accordance with a first mode of operation includes shifting the phase angles of spectral components in the audio signal in accordance with a first frequency resolution and a first time resolution, and shifting the phase angles of spectral components in the audio signal in accordance with a second mode of operation includes shifting the phase angles of spectral components in the audio signal in accordance with a second frequency resolution and a second time resolution.

45. (Original) The method of claim 44 wherein the second time resolution is finer than the first time resolution.

46. (Original) The method of claim 44 wherein the second frequency resolution is coarser than or the same as the first frequency resolution, and the second time resolution is finer than the first time resolution.

47. (Original) The method of claim 45 wherein the first frequency resolution is finer than the frequency resolution of the spatial parameters.

48. (Original) The method of claim 46 or claim 47 wherein the second time resolution is finer than the time resolution of the spatial parameters.

49. (Currently Amended) The method of claim 39 wherein said first mode of operation comprises shifting the phase angle of spectral components in at least one or more of the plurality of frequency bands, wherein each spectral component is shifted by a different angle, which angle is substantially time invariant, and said second mode of operation comprises shifting the phase angles of all the spectral components in said at least one or more of the plurality of frequency bands by the same angle, wherein a different phase angle shift is applied to each frequency band in which phase angles are shifted and which phase angle shift varies with time.

50. (Original) The method of claim 49 wherein in said second mode of operation the phase angles of spectral components within a frequency band are interpolated to reduce phase angle changes from spectral component to spectral component across a frequency band boundary.

51. (Original) The method of claim 39 wherein the first mode of operation comprises shifting the phase angle of spectral components in at least one or more of the plurality of frequency bands, wherein each spectral component is shifted by a different angle, which angle is substantially time invariant, and said second mode of operation comprises no shifting of the phase angles of spectral components.

52. (Currently Amended) The method of claim 39 wherein said shifting includes a randomized shifting.

53. (Original) The method of claim 52 wherein the amount of said randomized shifting is controllable.

54. (Currently Amended) The method claim 39 further comprising shifting the magnitudes of spectral components in the audio signal in response to one or ones of said spatial parameters in accordance with a first mode of operation and a second mode of operation.

55. (Original) The method of claim 54 wherein shifting the magnitude includes a randomized shifting.

56. (Original) The method of claim 54 or claim 55 wherein the amount of shifting the magnitude is controllable.

57. (Original) In an audio decoder receiving M encoded audio channels representing N audio channels, where M is one or more and N is two or more, and receiving a set of spatial parameters relating to the N audio channels, a method comprising

deriving N audio channels from said M audio channels, wherein said N audio channels are derived from said M audio channels by a process that includes actively dematrixing said M audio channels, wherein the dematrixing operates at least partly in response to characteristics of said M audio channels and at least partly in response to one or ones of said spatial parameters.

58. (Canceled)

59. (Currently Amended) A computer program, stored on a computer-readable medium for causing a computer to perform the methods of any one of claims 1, 17, 18, 39, and 57.

60. (Canceled)

61. (Canceled)

62. (Canceled)

The objection to the Specification

The disclosure stands objected to because it contained an embedded hyperlink. In response, the specification is being amended to remove the hyperlink.

The Information Disclosure Statements

The Office Action points out that two NPL documents submitted on June 4, 2007 do not have dates. This will be addressed in a separate submission by applicant.

CONCLUSION

In view of the present amendments and remarks, the application is believed to be in condition for allowance and such favorable action is earnestly solicited.

Respectfully submitted,

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